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ABSTRACT

One criticism of teacher preparation programs is that teacher education graduates, especially high school teachers, are ignorant of subject matter, particularly in comparison with non-education graduates who majored in the same subject areas. This study compared the grades received by education students with the grades received by non-education students who took the same subject matter courses. The study was restricted to one institution and to a comparison of the grade point averages of students preparing to be high school teachers. It is noted that students seeking certification for high school teaching must complete at least one major in an academic area, and their grades in their major can therefore be compared with those of non-education students taking the same major. The data acquired at this institution appear to refute charges that teacher education graduates are academically inferior to non-education graduates. Because this was a pilot study, the methodology used in collecting and analyzing data is outlined in detail. It is recommended that other institutions should undertake and share the results of similar comparative studies. (JD)

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FINAL REPORT

PHI DELTA KAPPA
GRADE POINT AVERAGE STUDY

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REPORT TO PHI DELTA KAPPA ON THE
GRADE POINT AVERAGE STUDY

Background

In the summer of 1981, the Kentucky Association of Colleges for Teacher Education summarized for the Kentucky Council on Teacher Education and Certification the results of a five-institution survey. The survey compared the mean grade point average of all teacher education students and the mean of all non-teacher education students at each of the institutions. In every case, the teacher education students' mean was the same as or higher than the mean of the non-education students. There were no interinstitutional controls for methodology, however, and the study was limited to overall means. Uses to which the results could be put were curtailed by these limitations. It was, however, a beginning.

Since the KACTE report was the only readily available study on how education students rated academically in comparison with non-education students, there was no solid data base that could be used to respond to current criticisms about the lack of subject matter knowledge of teacher education graduates. Except for local responses to specific criticisms (see Appendix 1 for an example), allegations about education students' weak academic standing, particularly in relation to Arts and Sciences majors, have generally gone unchallenged.

In 1982, Phi Delta Kappa awarded a research grant in the amount of \$1000.00 (\$400 from the University of Kentucky chapter and \$600 from Phi Delta Kappa Headquarters) to follow up the initial 1981 study and to investigate the alleged disparity between the grades received by education students and those obtained by non-education students. A literature search revealed that no similar comparisons had been reported, and this fact meant that the current study had no conceptual or methodological guidelines to follow. As a result, considerable trial and error in planning, compiling data, programming, and summarizing took place. Much more time than expected elapsed between the initial announcing of the grant and this report to Phi Delta Kappa. If the problems, delays, and mistakes made have enabled other institutions or associations to undertake additional studies along the same lines, however, then our difficulties in bringing this study to a conclusion will have been worth the cost in time and effort.

Purpose of the Study

Current and longstanding criticisms of teacher preparation programs generally include two charges. The first is that teacher education graduates are ignorant of subject matter, particularly in comparison with

non-education graduates who majored in the same subject matter areas. This allegation is usually "substantiated" by a reference to the large amounts of time spent by students in education courses instead of in subject matter courses. The second charge grows out of the first--namely that whatever high grades are obtained by students in education are due to the non-demanding characteristics of the education courses taken.

The purpose of this study was to gather data to support or refute these charges.

Since at most teacher preparation institutions prospective high school teachers take the same subject matter content as non-education students who are in the same majors, the alleged lack of subject matter knowledge must consist of the amount and depth of content learned in the subjects studied. If education students gain less knowledge, one would predict that their grade point averages would be significantly lower than the grade point averages of non-education students taking the same subject matter courses. Following this logic, this study compared the grades received by education students with the grades received by non-education students who took the same majors (and therefore the same subject matter courses in the majors). Except for the "overall GPA" tabulations, only courses in the subject matter of the majors were included in this study--that is, no courses with an education prefix were counted in the "major GPA" tabulations.

There is a related purpose for the current study, which is to break new ground with the methodology used. If this initial research is viewed as a pilot study, it offers a model that other institutions can use in collecting and examining data for similar studies. For this reason, the methodology section outlines in detail the steps used in formatting and tabulating the data. Only when several such studies have been completed, and results compiled regionally and nationally, will there be sufficient data to provide firm ground for speaking out about the allegations that education students are academically weaker than other students.

It would be unrealistic, of course, to expect all results to favor education students. It is entirely conceivable that teacher educators will not welcome some of the conclusions to be drawn from such studies. At least, however, we will be knowledgeable about where we stand and whether our critics are correct in their charges. Where criticisms are not supported by our data, we will be able to respond vigorously and to redirect reform efforts to areas that truly need reform.

Limitations of the Study

Five limitations must be recognized:

(1) The study was restricted to a comparison of the grade point averages of students preparing to be high school teachers and the grade point averages of non-education students graduating in the same subject matter areas. Students seeking certification for high school teaching must complete at least one major in an academic area, and hence their grades in their major can be compared with those of non-education students taking the same major. The same logic in locating appropriate courses and categories for comparison is not true of areas outside secondary teaching. Elementary education, early childhood education, special education, physical education and health education were excluded because of the difficulty in conceptualizing and programming a comparative study that could as logically utilize the most appropriate subject matter courses. We selected the most clearcut comparison, a selection that should not be viewed as a denial of the importance of the other areas. Furthermore, the allegation about lacking subject matter knowledge is most usually levelled at high school teachers.

(2) Results and conclusions are reliable insofar as the academic histories provided by the institution are accurate and complete.

(3) Decreasing enrollments have resulted in very small numbers of education students for comparison in many of the subject areas. One attempt to remedy this limitation was to cluster similar subject areas, as will be described below.

(4) The study uses data from only one institution, and therefore is not necessarily generalizable to other institutions. Attempts to involve other in-state public and private institutions were unsuccessful, largely because of the difficulty in acquiring the needed data and in handling the data once acquired. Appendix 4, however, contains information about a similar study just completed at an out-of-state institution. Results of that study support the results of this study.

(5) Selected students were recent (1982-83) graduates in selected subject-matter majors. Therefore they do not represent the total undergraduate student population currently on campus, many of whom will transfer to other programs or will leave school before graduating.

Methodology

The first difficulty encountered was that of locating the needed data, which at this institution proved to be on two completely separate and massive computer files. How to obtain the data for the period selected, and how to handle the information once it was made available, became

the first and second problems to be solved. Interested and sympathetic administrators at several levels cooperated to help solve the first problem, that of acquiring the needed data. The programming expertise available through the College of Education's Center for Professional Development (most notably Dr. Edward Kifer, Dr. Warren Lacefield, and Dr. Dorie Iuk) overcame the second problem.

The academic histories of all 1982-83 university graduates (N=673) were acquired and placed on two confidential files for College of Education use. One contained degree status and the other contained course records. These data banks were reduced by eliminating those students whose degrees or majors (as categorized by the major area code, known as the HEGIS code) did not have corresponding teacher certification potential. All non-baccalaureate degrees were also eliminated. Appendix 2 contains a listing of all degree codes and major subject area (HEGIS) codes selected for this study.

Our initial data indicated that the total number of graduating education students at the secondary level was 66. Because the number of observations in each subject area appeared to be too small for reliable comparisons, related subject majors were clustered into seven areas. These were based on areas delineated by the University's

general studies program and by the College of Education's certification files, which listed certification programs on file with the State Department of Education. Table 1 lists these seven area clusters and the corresponding majors.

Table 1

(Clusters Identified for GPA Comparisons)

<u>Area</u>	<u>Cluster Name</u>	<u>Majors Within the Cluster</u>
1	natural sciences	physics, chemistry, botany, biology, geology, astronomy
2	mathematics	mathematics, computer science
3	foreign language	French, Spanish, German, Italian, Greek, Latin, Russian
4	music	instrumental, performance, history, education
5	English	English literature, theater arts, linguistics, comparative literature
6	social sciences	history, economics, political science, sociology, geography, anthropology, psychology
7	art	history, studio, education

Students were assigned to a cluster according to their HEGIS major. Then for each of the seven clusters, the relevant course prefixes were identified. Appendix 3

contains a complete listing of the course prefixes included within each major cluster.

The data set included a special T code assigned to those students who applied for teacher certification, regardless of the college in which these students were enrolled. That is, two students might both be enrolled in the College of Arts and Sciences, both majoring in English, but only one might apply and be accepted into the secondary education program for obtaining certification to teach. That student's academic record would contain the T code.

The two files were then merged by students' social security numbers; 479 observations were used in the final analysis. Even so, this reduced combined file still contained the chronological course listings by semester for each student, totalling more than 18,000 items.

These individual histories were systematically reformatted for cost efficiency. First, overall and major grade point averages were computed. The resulting working data set included only the following variables: social security number, degree code, major (HEGIS) code, total credit hours received, total credit hours received in the major, major cluster (i.e., 1-7), certification status (T or non-T), overall GPA and major GPA.

Results

Univariate analyses of variance were performed to test for relationships between certification status, cluster, and major and overall GPA. Duncan's Multiple Range Test was used for post-hoc analyses. Results are summarized below.

No relationship was found between T-status, area and total grade point average ($F=.68$, $p=.79$); see Tables 2 and 3.

Table 2

Comparison of Total and Major GPA's

	<u>T-Students</u>	<u>Non-T Students</u>
Total Mean GPA	3.0	3.0
Major Mean GPA	3.1	3.1
Number of Students	66	413

(No statistically significant differences found between T- and non-T)

Table 3
Overall Mean GPAs by Cluster

<u>Cluster</u>	<u>N of Students</u>	<u>Mean Overall GPA</u>
Foreign Language	15	3.2
English	44	3.1
Art	31	3.0
Natural Sciences	134	3.0
Music	20	3.0
Mathematics	27	3.0
Social Sciences	208	3.0

(No statistically significant difference found between clusters)

A significant main effect was found on Major GPA for area (or cluster) regardless of student T-status ($F=3.74$, $p=.0001$). Mean major GPAs for mathematics and natural science majors were significantly lower than art, English, music and foreign language major GPAs. Social sciences and art major GPAs were significantly lower than foreign language major GPAs. (This result should be studied further for purposes of identifying grade distribution patterns as these relate to subject areas.) See Table 4.

Table 4
Major GPAs by Cluster

<u>Cluster</u>	<u>N of Students</u>	<u>Mean Major GPA</u>
Foreign Languages	15	3.5
Music	20	3.3
English	44	3.3
Art	31	3.2
Social Sciences	208	3.0
Mathematics	27	2.9
Natural Sciences	134	2.9

No main effects were found for T-status on either major or overall GPA, nor was any interaction detected. See Table 5.

Table 5

Total and Major GPAs by Cluster and T-Code

<u>Cluster</u>	<u>N of Ss.</u>		<u>Mean</u>		<u>Mean</u>	
			<u>Total GPA</u>		<u>Major GPA</u>	
	<u>T</u>	<u>Non-T</u>	<u>T</u>	<u>Non-T</u>	<u>T</u>	<u>Non-T</u>
Natural Sciences	7	127	3.2	3.0	2.9	2.9
Mathematics	11	16	2.8	3.1	2.7	3.1
Foreign Languages	3	12	3.2	3.2	3.2	3.6
Music	13	7	3.0	3.1	3.4	3.2
Social Sciences	17	191	3.0	2.9	3.1	3.0
English	11	33	3.0	3.1	3.2	3.3
Art	4	27	3.0	3.0	3.2	3.2

(No statistically significant differences found between T and non-T students.)

Conclusions

The data acquired at this institution appear to refute charges that teacher education graduates are academically inferior to non-education graduates. Should similar studies produce similar results, teacher educators and related professions should make every effort to publicize these data.

In order to obtain a widespread data base, other institutions should be encouraged to undertake and share the results of similar comparative studies. The methodology used in this PDK study offers useful guidelines for researchers.

Within an institution, such data will be useful in tracking relationships between admission and retention policies and academic quality of students graduating from specific programs. Institutions with grade inflation problems will have a basis for examining grading practices across subject matter areas.

Compiling similar information over several institutions will offer generalizable data about the academic standing of education students. Areas in addition to those of secondary education majors should be included in comparative studies. It will be necessary to conceptualize and implement logical comparisons between elementary, special education, early childhood, and HPER students and non-education students taking non-education courses; the difficulty will be in selecting a sufficiently large group of courses above the general studies level, or in equating professional-level education courses with upper division non-education courses.

It is noteworthy that Illinois State University recently completed a study comparing the grade point averages of education and non-education students (see Appendix 4). The results obtained in that institution tend to support the results obtained at this institution, further enforcing the desirability of obtaining and comparing the results of additional studies in several institutions.

It may be that in addition to answering charges about student ability, such studies will provide one irrefutable means of looking at the quality of students across education programs. Considering current cost-conscious pressures to liquidate redundant programs in education (as in other areas), comparative studies like the current one, if done on a statewide basis, might encourage legislators and administrators to distinguish between programs offering quality training and those churning out teachers who, indeed, are academically inferior to non-education graduates.

Criticism of teaching program ignores facts

By Elizabeth Nelli

Ellen Mizell's column in the Feb. 28 Herald-Leader is a well-meaning attempt to point to a solution to the seemingly endless discussions about how to improve education.

Yet Ms. Mizell adds another layer of misinformation to the general misunderstanding of teacher preparation when she states that "testing will weed out those would-be teachers who majored in education and, in consequence, have managed to avoid courses in math, science, English, history and other branches of academic knowledge."

Like other concerned people who speak out about what they have heard or what they have heard others say (rather than undertake the less exciting task of searching for facts that might dilute their biases), Ms. Mizell has produced an emotional outburst. Her statement would have been greatly altered had she bothered to use a university catalog to check the accuracy of her facts.

First, no one can "major in education" and avoid courses in other subjects. All university students, regardless of the field in which they intend to concentrate, must complete the General Studies Program. For education students at the University of Kentucky, this program consists of at least 36 hours, or 12 courses, in physical sciences, biological sciences, humanities, history and social and behavioral studies. There are no exceptions to this requirement.

The author

Elizabeth Nelli is assistant dean of the University of Kentucky College of Education. This article was written in response to a column by Ellen Mizell.

Furthermore, students who intend to become teachers must have completed 57 hours of non-education course work — about 19 courses in the very same academic disciplines that Ms. Mizell advocates — before they are even eligible to apply for admission to a teacher preparation program. Thus students cannot be considered for a teacher preparation program until they are finishing their sophomore year or beginning their junior year. At this point all students must pass national skills tests in math, reading and composition at least at the 12th-grade level of proficiency before they are even eligible to apply for admission to a teacher preparation program. They must also show a grade-point average that indicates their ability to achieve at least a C-plus in their major, as well as over all their course work.

Those who are admitted — and Ms. Mizell might be surprised to learn that at UK fewer than half of those who initially apply are accepted — then must take intensive course work in their field of concentration. Future history teachers take history courses, the same courses and the same number of courses as history majors. Future math teachers take math courses, the

same courses and the same number of courses as math majors. Future science teachers take science courses, the same courses and the same number of courses as science majors. Future English teachers take English courses, the same courses but usually one more than the number required of English majors.

This point needs emphasizing: future teachers must fulfill *all* the requirements fulfilled by other students majoring in the same academic subject area. A student who intends to be a history teacher must complete all the requirements set by the History Department for students who will graduate with a degree in history. The same is true of all other subject areas. Why, then, does the myth persist that teachers are lacking in the subject matter knowledge acquired by non-education graduates?

Like Ms. Mizell, many people simply assume that people majoring in education take only courses in education. Therefore, they reason, educational problems must be caused by education courses. Many refuse to believe that at UK, students who are preparing to be high school teachers must complete a minimum of 131 credit hours (the UK minimum requirement for graduation is 120 hours). Of these 131 hours, only 18 hours are "education" courses for high school teachers.

Presumably, even Ms. Mizell would expect teachers to have some knowledge of school law, psychology, mainstreaming, facilitating reading

skills in subject areas, utilization of computers and other classroom technology, and methods of teaching their subject specialty.

Another 12 hours are spent in student teaching, an on-site internship situation that puts the student in the classroom with an experienced teacher. Clearly students in teacher preparation programs take the vast majority of their course work *outside* education. Hence blaming education courses for pre-empting courses in the academic disciplines is really misdirecting efforts at improving education, since people will then assume that abolishing all education courses is the solution to educational problems that have evolved over decades. Knowledge of subject matter is simply not the issue that many legislators and misinformed citizens assume it to be.

It is a shame that citizens who are truly concerned about improving education continue to reiterate the same longstanding errors of fact. No one denies the need for reform and innovation in education at all levels. Surely the process of improvement will work only if all participants possess and use accurate information, rather than continuing to mouth misunderstandings, bias and factual errors.

APPENDIX 2

Degree Codes Selected for Study

<u>University Code</u>	<u>Abbreviation</u>	<u>Degree Name</u>	<u>N of Ss</u>
JA	B.A.	Bachelor of Arts	291
KA	B.A. Educ.	Bachelor of Arts in Education	37
MA	B.S.	Bachelor of Science	140
N6	B.S. Educ.	Bachelor of Science in Education	0
Q2	B.M.	Bachelor of Music	3
RA	B.M.E.	Bachelor of Arts in Music Ed.	13
MU	B.S.M.	Bachelor of Science in Music	0
M6	B.S.B.E.	Bachelor of Science in Business & Econ.	17
Total N. of Ss			501

HEGIS (subject area major) Codes
Selected for Study

Cluster 1: Natural Sciences

HEGIS

0401 Biology
0402 Botany
1911 Astronomy
1905 Chemistry
1914 Geology
0411 Microbiology
1902 Physics
0844 Science Education
0407 Zoology
1911 Astronomy

Cluster 5: Social Sciences

HEGIS

2202 Anthropology
2204 Economics (A&S)
2206 Geography
2205 History
2207 Political Science
2001 Psychology
2208 Sociology
0575 Economics
0517 Economics (B & E)
0845 Social Sci. Educ.

Cluster 2: Mathematics

HEGIS

1701 Mathematics
0843 Math Education

Cluster 6: English

HEGIS

1505 Linguistics
1503 Comparative Lit.
0842 English Education
0841 Dramatics & Speech
Education
1501 English

Cluster 3: Foreign Language

HEGIS

1103 German
1110 Greek
1104 Italian
1109 Latin
1106 Russian
1105 Spanish
1102 French
0840 Foreign Lang. Ed.

Cluster 7: Art

HEGIS

0831 Art Education
1003 Art History
1001 Studio Art
1002 Studio Art

Cluster 4: Music

HEGIS

1006 Music
1004 Applied Music
0832 Music Education

APPENDIX 1

Course Prefixes Included in Compiling the GPA by Clusters

Cluster 1: Natural Sciences

ANA	Anatomy
ASC	Animal Sciences
AST	Astronomy
BIO	Biology
BCN	Biochemistry
BOT	Botany
CHE	Chemistry
ENT	Entomology
GLY	Geology
HOR	Horticulture
MB	Microbiology
PGY	Physiology, Biophysics
PHY	Physics
IOO	Zoology

Cluster 2: Mathematics

MA	Mathematics
CS	Computer Science
STA	Statistics

Cluster 3: Foreign Languages

GER	German
CLA	Classical Languages
SPI	Spanish and Italian
SO	Slavic and Oriental
FR	French

Cluster 4: Music

MUC	Class Instruction, Music
MUP	Music Performance
MUS	Music

Cluster 5: Social Sciences

ANT	Anthropology
APP	Appalachian Studies
BSC	Behavioral Sciences
ECO	Economics
GEO	Geography
HIS	History
LAS	Latin Americ. Studies
PS	Political Science
PSY	Psychology
SOC	Sociology
WS	Women's Studies

Cluster 6: English

COM	Communications
ENG	English
JOU	Journalism
LIN	Linguistics
LS	Library Science
TA	Theatre Arts
CLT	Comparative Lit.
SP	Speech

Cluster 7: Art

A-E	Art Education
A-H	Art History
ART	Art
A-S	Art Studio

Education students Fare well in Illinois survey

Teacher education students may be brighter and more academically able than many people think—so a recent study conducted by Illinois State University's (ISU) College of Education suggests.

The study, which analyzed data on 1980-81 and 1981-82 ISU teacher education (TE) and non-TE graduates in spring and summer of 1983, found that native (nontransfer) TE graduates in both years recorded a higher mean English ACT score than did native non-TE graduates. In one of the two years examined, TE graduates also showed higher mean math and composite ACT scores than did non-TE graduates.

In addition, high school percentile ranks and grade-point averages for TE graduates in both years exceeded those of non-TE graduates, suggesting that teacher education programs at ISU attract some of the more qualified students who attend the university.

To examine the notion that TE graduates have higher cumulative grade-point averages at ISU because they take easier courses, researchers compared grades received in selected university studies courses taken by 1981-82 TE graduates and non-TE graduates. Courses selected had high enrollments, were representative of university studies courses taken by both groups of graduates, and represented most colleges in the university.

The results showed that TE graduates had a slightly higher overall mean grade-point average (2.78) for the 20 courses than did the non-TE graduates (2.70). TE graduates registered higher mean grade-point averages than did non-TE graduates in 12 of the 20 courses: Biology 100, Chemistry 102, English 101, Communications 110, Political Science 105, Psychology 111, Sociology 106, Speech Pathology 115, Industrial Technology 171, Health, Physical Education, and Recreation 180, Art 155, and Music 151.

In seven of the 20 courses (Economics 100, English 105, History 155, History 156, Corrections 101, Business Education Administration 111, and Art 150), non-TE graduates had a higher mean grade-point average than did TE graduates. In one course, Philosophy 138, TE graduates and non-TE graduates had the same mean grade-point average. No patterns were discernable

in the kinds of courses in which either the TE majors or the non-TE majors tended to do better. In three of the four colleges that offer both TE and non-TE programs, TE majors had a higher mean grade-point average than did non-TE majors in at least 70 percent of the courses examined.

The researchers also studied the performance of TE and non-TE graduates in the same major. They found that, in each of the last three years, TE graduates' average grade-point averages within their majors exceeded the non-TE graduates' grade-point averages in the same majors. This result held across all four colleges and in 11 of the 15 departments.

According to Robert L. Fisher, director of ISU's Office of Clinical Experiences and Certification Processes, "Much of the information about the 'poor quality' of teacher education students being reported in the professional and popular media is based on information about students entering teacher education programs. Our program of admission and retention in teacher education actively screens students out of teacher education and offers students the opportunity to self-select out of the program. . . . Therefore, we focused our study on the academic ability of graduates of our program."

Fisher added that the study results "indicate that some very good students are going into teacher education. He said that the College of Education will continue and expand its analysis of its graduates next year."

APPENDIX 4